

Chapter 9 Review

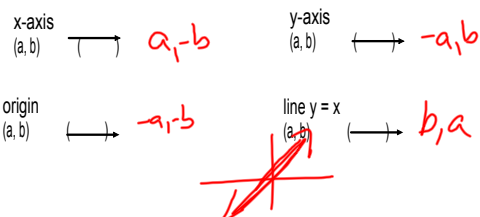
Transformation --maps an initial figure, preimage, to a final figure, image

Isometry --transformation that does not change the size or shape of the preimage

Reflection --type of transformation representing a flip of a figure

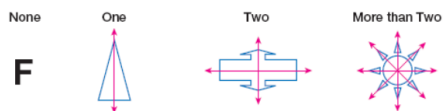
A reflection can be made in a point, line, or a plane

Reflections on the Coordinate Plane

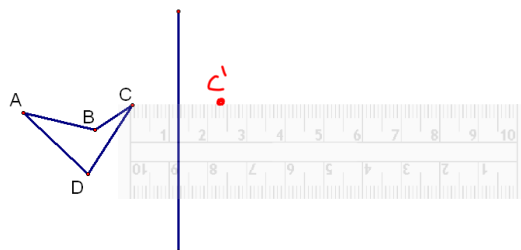
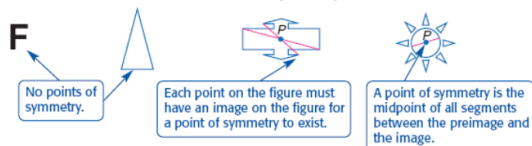


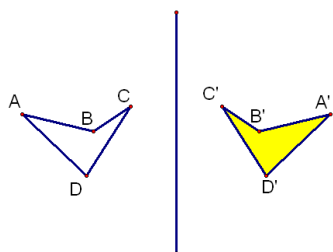
LINES AND POINTS OF SYMMETRY Some figures can be folded so that the two halves match exactly. The fold is a line of reflection called a **line of symmetry**. For some figures, a point can be found that is a common point of reflection for all points on a figure. This common point of reflection is called a **point of symmetry**.

Lines of Symmetry



Points of Symmetry





9-2 Translation

Translation--transformation that moves all points of a figure the same distance in the same direction

A translation is an isometry.

(slide, glide, shift)

$$(x, y) \rightarrow (x+2, y-3)$$

What translation mapped

$$(3,8) \rightarrow (-2,4)?$$

$$(x,y) \rightarrow (x-5, y-4)$$

What translation mapped

$$(0,9) \rightarrow (-6,9)?$$

$$(x,y) \rightarrow (x+6, y)$$

Composition of Reflections-- Successive reflections in parallel lines

The result is a translation.



Glide Reflection--Translation and a reflection

9-3

A Rotation -is a transformation that turns every point of a preimage through a specified angle and direction about a fixed point.

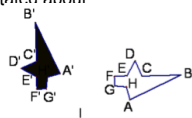
The center of rotation -is the fixed point.

The angle of rotation -is the specified angle.

Rotations are generally measured with counterclockwise turns.

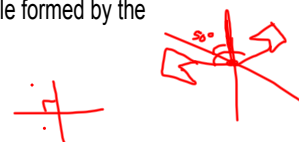
A half-turn is 180° and a full-turn is 360° .

Examples: Polygon ABCDEFGH is rotated about the point I 90° .



Postulate 9.1

When rotating a figure by reflecting it in two intersecting lines, the angle of rotation is twice the measure of the acute or right angle formed by the intersecting lines.



Corollary 9.1

Reflecting an image successively in two perpendicular lines results in a 180° rotation.

If a figure can be rotated about a point less than 360° and the image and preimage are indistinguishable, then the figure has rotational symmetry.

Order -the number of rotations of less than 360° (including 0°) that produce an image indistinguishable from the original.

Magnitude -the number of degrees for each order. ($360/\text{order} = \text{magnitude}$)

9.5 Dilation

Dilation is a transformation that changes size

Center point

scale factor--r

$|r| > 1$ enlargement

$|r| < 1$ reduction

$|r| = 1$ congruence transformation

Since a dilation is not an isometry, it is called a similarity transformation.

Segment lengths

$$AB = 3$$

Coordinates

$$r = 2$$

$$A'B' = \underline{6}$$

$$A'B' = 12$$

$$r = \frac{1}{2}$$

$$AB = \underline{24}$$

9-6 Vectors

Vector --quantity that has both magnitude, or length, and direction

Component form

$$\langle x_2 - x_1, y_2 - y_1 \rangle$$

Be able to:

Graph a vector.

Find the component form.

Find the magnitude.

Find the direction.

Translate a shape under a vector.